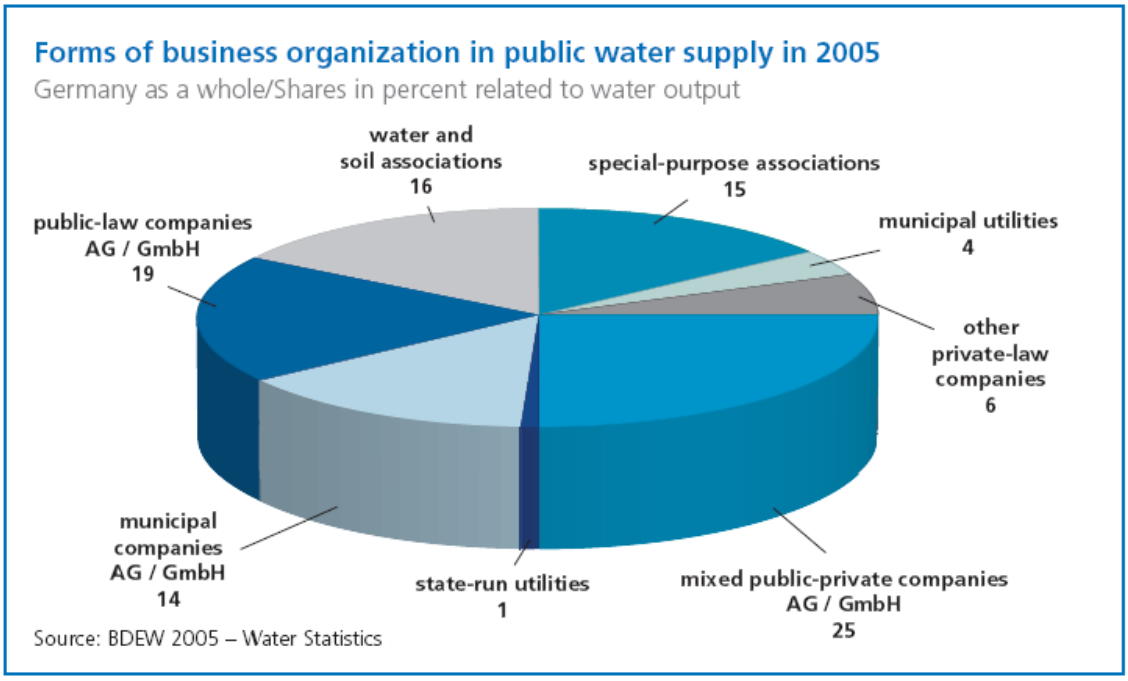
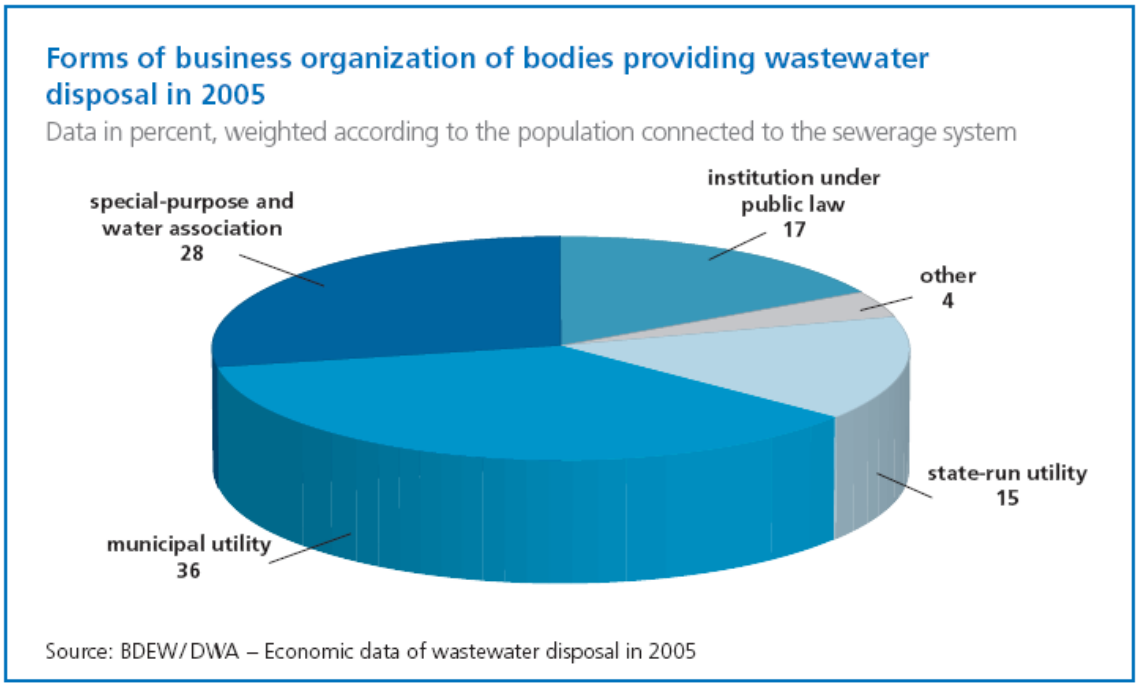
Germany: Water Supply and Wastewater Disposal

Andrea Stahl
August 2008
ID# 14264596

The German water supply and wastewater disposal industry has to adhere to stringent standards in terms of efficiency, security, quality of supply and disposal, customer service and sustainability. While water supply and wastewater disposal are considered to be of general interest and as such are at the core of municipalities' public services . Germany has a pluralistic supply and disposal structure with public and private companies active in this sector. In total, there are approximately 6,400 water supply utilities in Germany. However, more than half of the drinking water in Germany is supplied by only about 100 large corporations (about 1.6% of the total number of companies) mainly serving major metropolitan areas.



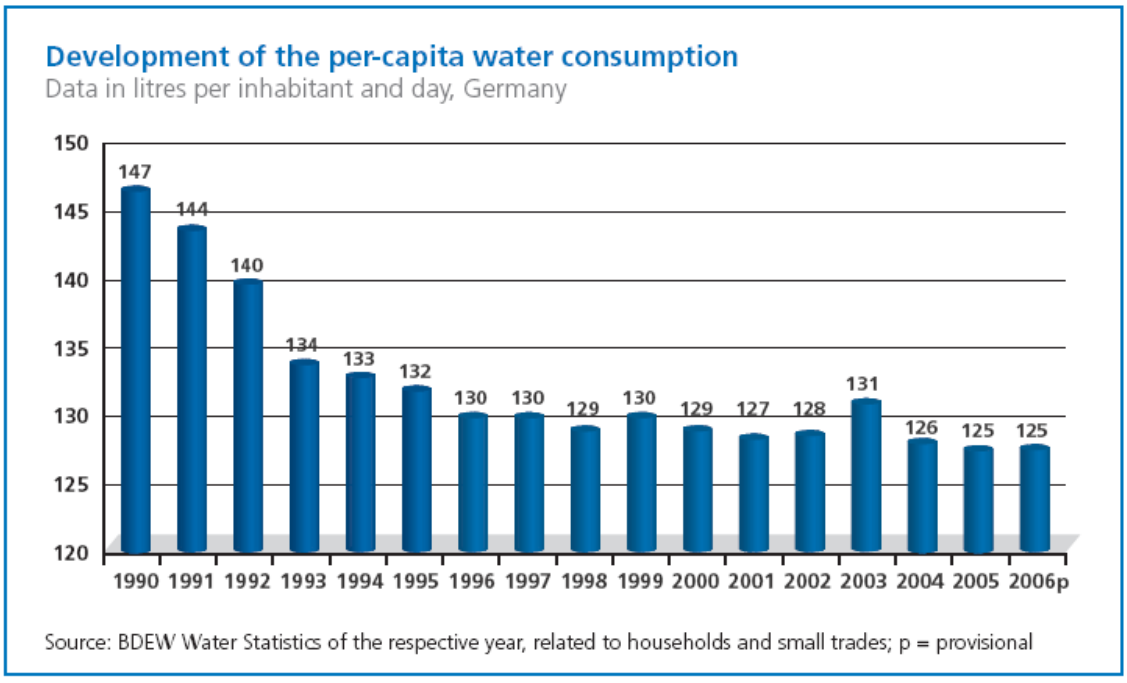
In contrast to drinking water supply, wastewater disposal is dominated by public enterprises: wastewater disposal is seen as an obligation of municipalities. In total, there are more than 6,900 wastewater disposal enterprises in Germany.

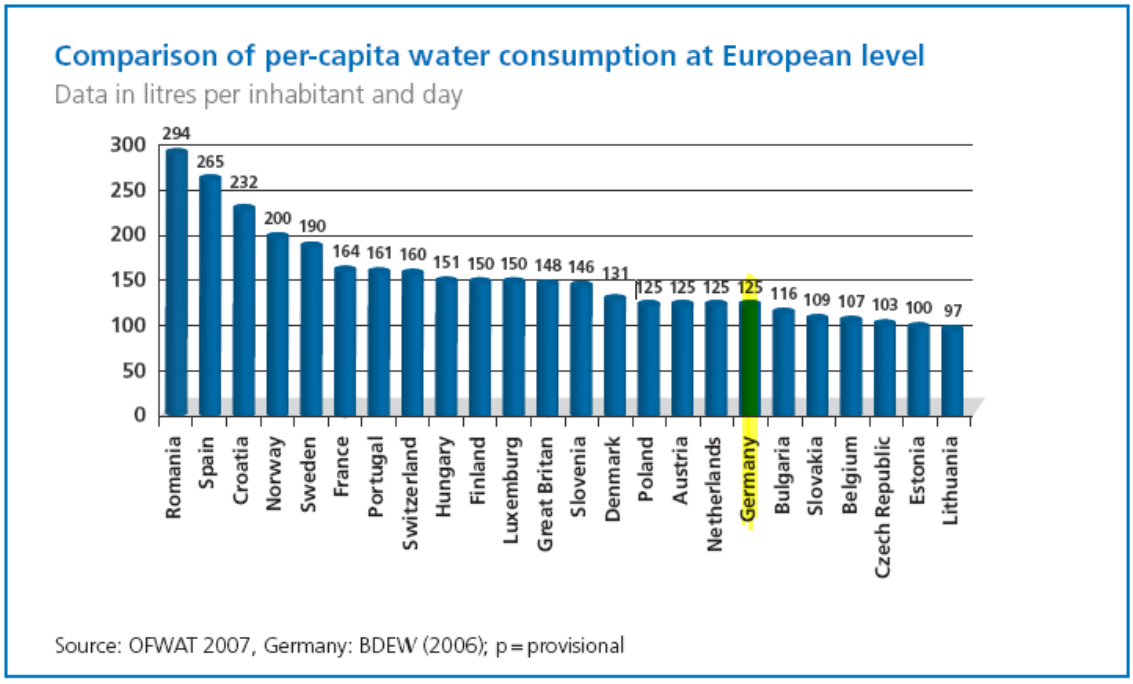


Long-term interruptions of supply are unknown in Germany. This is mainly due to the high technical standards of treatment and distribution and to the very good condition of the networks. German water supply utilities have by far the lowest losses of water in their pipeline systems in Europe. Drinking water of excellent quality is available in sufficient quantities. Wastewater is treated almost nationwide in accordance with the highest EU purification standards - in contrast to many other EU countries.

Germany is in a comfortable resource situation. Water consumption has declined significantly over the past 10 years. Throughout Europe, the daily per-capita consumption varies between 97 and 294 liters; with Germans consuming 125 liters on average per day. From 1990 to 2006, total public water supply to customers has declined from 5.99 to 4.65 billion m^3 (minus 22 percent.) Water consumption of households and small companies account for almost 80 percent of the water supply, while large industrial clients consume 14.2 percent. Differing from other European markets, German industry covers 96 percent of its water demand by its own production. Germany's total annually renewable water reserve amounts to 188 billion m^3. Only 19 percent of these resources are actually utilized (mining, agriculture, manufacturing: 4.1%, public water supply: 2.9%, thermal power plants: 12 %).

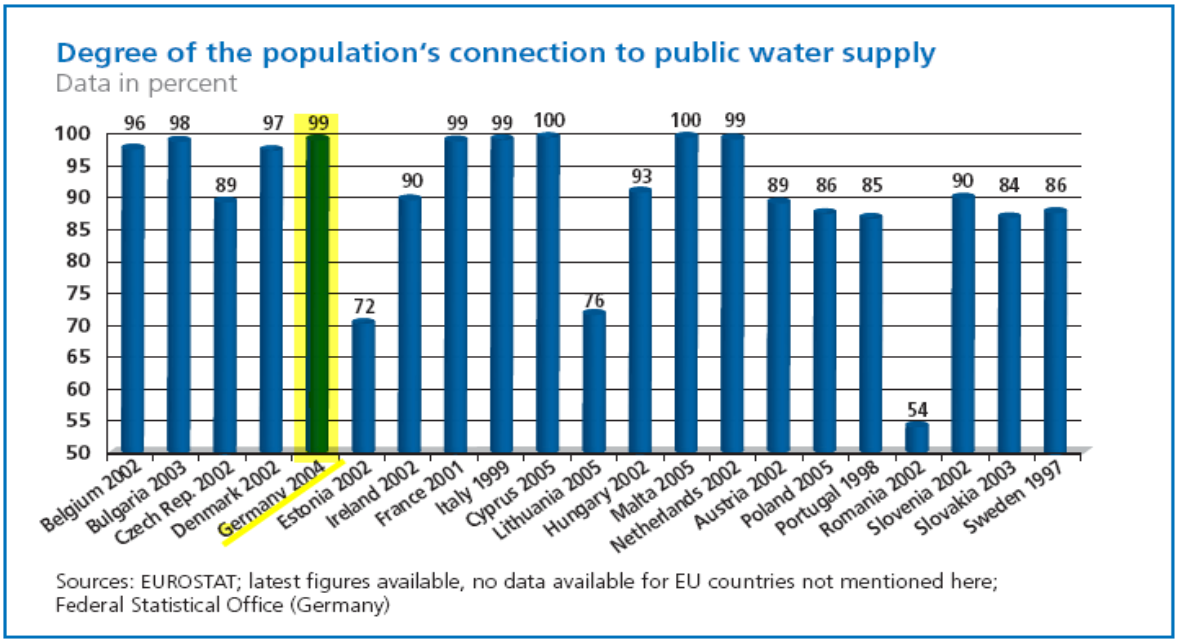
The considerable decrease in private per-capita and industrial consumption leads to under-utilization of facilities and leaves little room for further operational downsizing, as for example, water mains need to be intensively flushed to avoid, for instance, deposits and corrosion as well as hygienic problems attributable to longer hydraulic residence times and lower flow velocities. Operational changes depending on regions are also required in terms of wastewater collection and draining, such as sewer flushing and adjustments of wastewater treatment in sewage. These measures are costly and will add to the end-user prices. The anticipated decline in Germany's population from 82 million today to only 59 million in 2050 may require substantial regional modification of water supply and wastewater disposal facilities. Moreover, decentralized retention of precipitation water is increasingly gaining in importance. Also in urban development, the problems of torrential rain need to be tackled through adequate free space planning (underground retention and storm water control systems). Adequate protection of facilities, sufficient volume of impounding reservoirs and sewage networks, and adjustment of security margins for the dimensioning of drainage systems will be additional important measures to future control of torrential rains and floods.





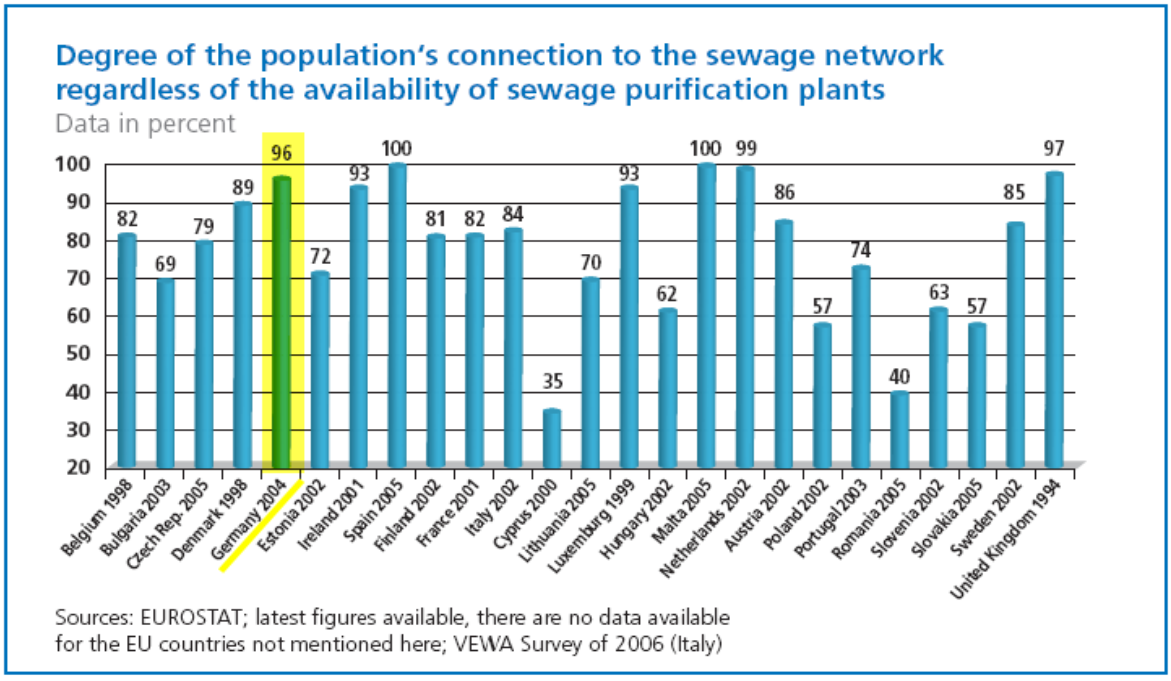
Water Supply

In Germany, the degree of connection of private households and industry to the public water supply is above 99 percent. The total length of the drinking water network in Germany is estimated at 500,000 km (not taking into account the actual house connections).



Sewage Systems

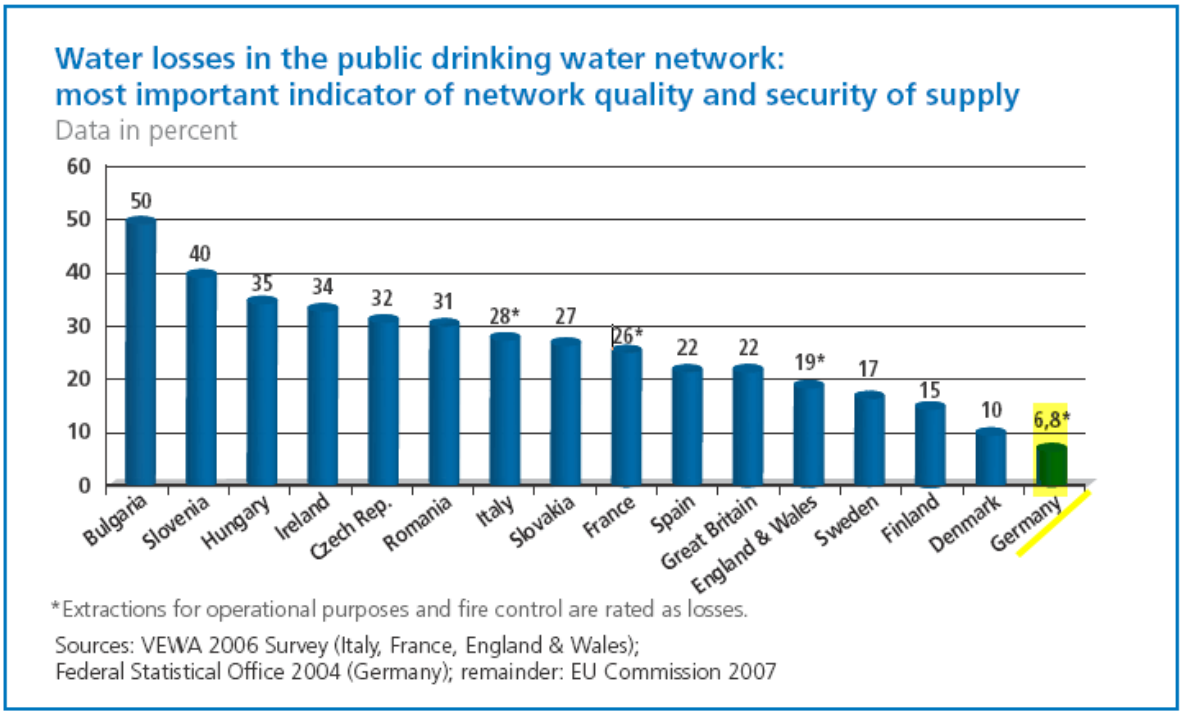
90 percent of the population are connected to sewage treatment plants meeting highest EU standards (biological wastewater treatment with nutrient elimination, "3rd purification stage".) The wastewater of households which are not connected to central wastewater systems is treated by decentralized sewage purification plants, so that the degree of connection to wastewater treatment plants comes up to almost 100 %. The length of the German public sewage network totals approximately 515,000 km. In addition, there are about 63,000 storm water drainage systems.



A check of – so far - 95 percent of the sewage network operators revealed that about 20 percent of the public sewage system need to be upgraded in the short or medium term. Another 21.5 percent show slight damages and need to be upgraded.

Water Losses - Supply

Low water losses within the public drinking water network are an important indicator of the quality of pipelines and security of supply. During the past few years, water losses in the German drinking water network have been decreasing. With less than 7 percent, Germany has by far the lowest water losses in Europe. Damages to supply lines, house connections and mains fittings have been on a constantly low level in Germany during the past few years, with less than 10 damages per year and per 100 km of supply line.



Drinking Water Quality

In Germany, the supervision of the quality of drinking water is based on the Drinking Water Ordinance through which the EC Drinking Water Directive ("Directive on the quality of water intended for human consumption") was implemented into national legislation. The drinking water quality is controlled by the responsible health authorities of municipalities and administrative districts. The latest report by Germany (2006) to the EU Commission showed that the requirements of the Drinking Water Ordinance are met in 99.6 percent of more than 1.1 million analyses conducted in 2005.

Pesticides, nitrate and coliform bacteria levels have to be observed more closely than others. Violations of set levels are only tolerated for a period of three years and on the condition that they are remedied. In addition to European law, the German law provides a binding imperative to minimize chemical substances in the water. In many places, the use of disinfectants in water treatment can be foregone without reducing the high hygienic drinking water standard. However, Germany has identified its entire territory as "nitrate-vulnerable" zone. Additionally, the diffuse pollution of water bodies with pesticide residues is considered a problem.

Drinking water quality – share of measurements showing a violation of limit values

Data in percent of total measurements in 2001 (n.s. = not specified)

	Germany	England & Wales*	France
turbidity	0.13	1.38	0.31
pH-value	0.06	0.40	0.09
nitrate	0.78	0.89	2.69
nitrite	0.07	6.27	0.03
fluoride	0	n.s.	2.30
coliform bacteria	0.63	0.36	1.28
E. coli	0.10	1.96	n.s.
PAH	0.04	8.89	0.05
pesticides (in total)	n.s.	0	0.97
pesticides (individ.)	1.16	1.16	n.s.
selenium	0.08	n.s.	0.91
lead	0	2.22	0.38

*in percent of non-conforming areas out of a total of 2,249 areas

Source: VEWA 2006 Survey

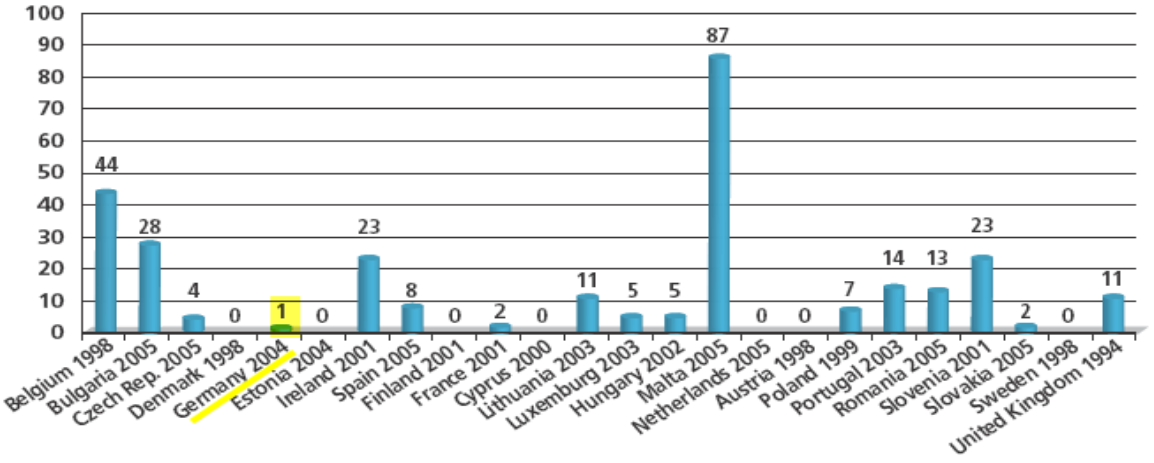
The preferred use of local resources for drinking water is characteristic for Germany. With a share of approximately 74 percent, ground water (including spring water) is the most important resource for drinking water. The share of utilized surface water (impounding reservoirs, bank filtrate, enriched ground water, direct extractions from rivers and lakes) amounts to 26 percent.

Wastewater disposal standards

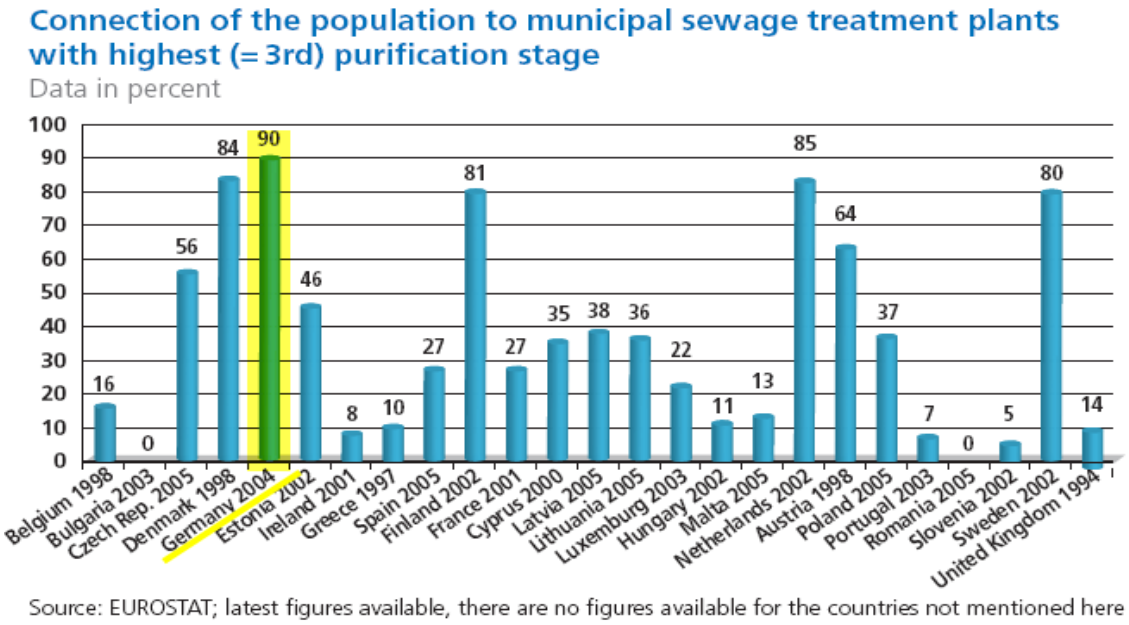
In Germany, only 1 percent of the wastewater volume is discharged into the environment without any form of treatment, whereas 90 percent are treated according to the highest EU standard (biological treatment with nutrient elimination, i.e. third purification stage pursuant to the EC Directive on ”Urban Wastewater Treatment), the remainder (9 percent) is treated in other, lower-standard sewage plants.

Untreated wastewater being discharged into the environment

Share of the population in percent



Source: EUROSTAT; latest figures available, no data available for EU countries not mentioned here

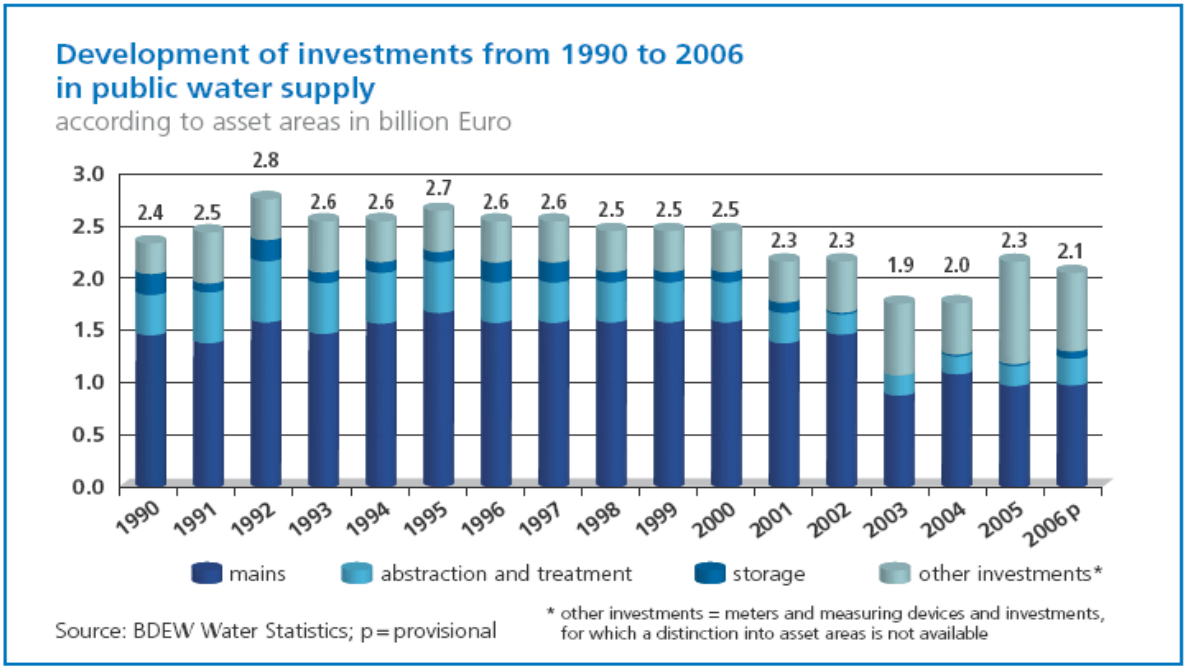


Source: EUROSTAT; latest figures available, there are no figures available for the countries not mentioned here

The quality of drinking water depends to a large extent on the quality of the raw water. This is ensured by about 16,300 water protection areas (covering 12.7 percent of German territory). The requirements to be met in water protection areas go beyond normal nationwide water protection levels. To achieve those, co-operations between agriculture and water supply utilities have proved to be effective, and compensation payments (included in the calculation of the end users' water price) are made to the agricultural sector.

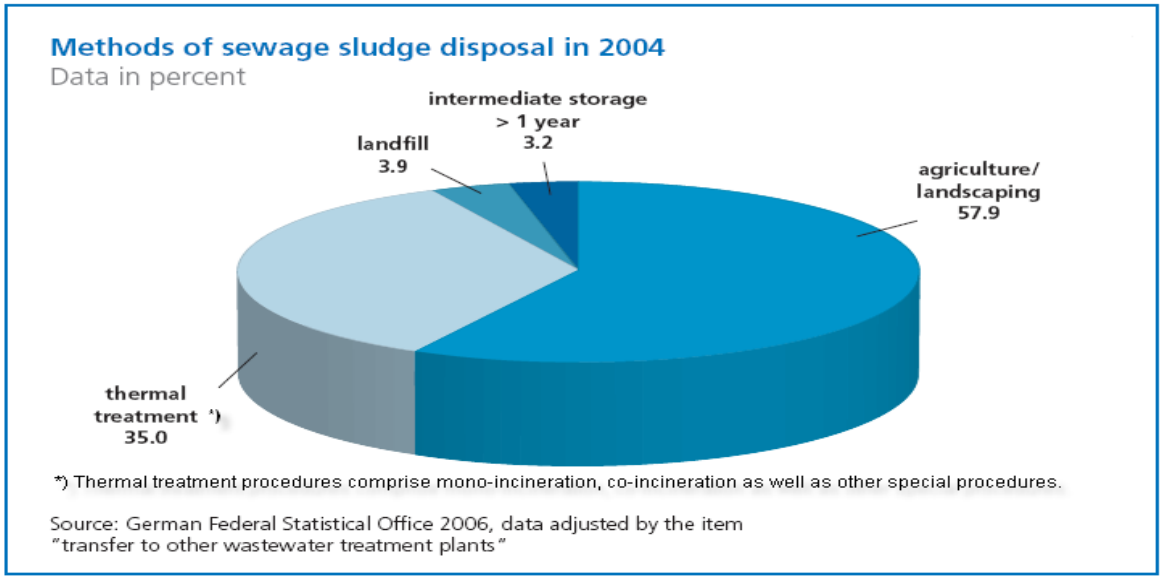
Investment and plant maintenance

Total investments in drinking water supply amount to more than EUR 2 billion annually; the major part of investments are spent on networks and plant maintenance. Almost one third of the existing sewers were built during the past 25 years.



With approximately EUR 5 billion annually, the wastewater sector has made investments at a high level for many years. A considerable part of a disposal utility's investment volume is passed on to private service enterprises: Around 70 percent of services in the field of planning, construction (90 %) and operation are outsourced to private companies.

Sewage sludge
In Germany, the volume of sewage sludge currently amounts to around 2 million tons. Stagnating or slightly decreasing volumes are expected for the future.



Over the past few years, thermal procedures in sludge treatment have gained in importance. while a decrease of landfilling has been recorded, which is attributable to the prohibition of waste landfills with higher contents of organic substances applicable since 2005. Also the share of sludge subjected to material recycling decreased considerably compared to the late 90's when this share was above 60 percent. The recycling rate has stabilized at a level of around 57 percent since 2003.

The most recent sewage sludge survey carried out by the German Association for Water, Wastewater and Waste (DWA) shows that the contents of pollutants in municipal sewage sludge are far below the limits of the applicable EC Directive. Furthermore, the data shows that sewage sludge recycled in agriculture and landscaping has significantly lower contents of pollutants than the sludge subjected to thermal treatment.

Water and waste water end-user prices
Pricing, quality, environmental requirements and water extraction rights are subject to strict control by the government . All costs (extraction, processing, distribution, collection, treatment) are covered by water and wastewater charges set by law whereas in other EU countries not all costs are reflected in the water price. Drinking water prices and wastewater charges have remained stable for many years. In 2007, average drinking water prices in Germany increased by 0.5 percent only. The average price for 1,000 liters of drinking water is EUR 1.85, wastewater charges came up to EUR 2.28 for (VAT, base rate, compensation payments and other levies included). Wastewater charges are typically levied in the form of a sewage charge based upon the freshwater consumed (regardless of whether the wastewater actually was fed back into the sewage system or used for example to water the garden). In some areas, precipitation charges are levied, based on the area of sealed surfaces.

Major Water Industry Associations in Germany

Association of Drinking Water from Reservoirs (Arbeitsgemeinschaft Trinkwassertalsperren e.V. – ATT)
ATT is a non-profit association consisting of abut 40 water supply utilities, water associations, impounding reservoir operations CHECK UNDERTAKER IN A DICTIONARY and **administrative** bodies, as well as university, examination and research institutes in the Federal Republic of Germany and the Grand Duchy of Luxembourg
Contact: www.trinkwassertalsperren.de

German Association of Energy and Water Industries (Bundesverband der Energie- und Wasserwirtschaft e.V. – BDEW)
BDEW represents approximately 1,800 companies o of which 1,100 are companies of the water industry. The spectrum of BDEW member companies ranges from local and municipal to regional and supra-regional suppliers. BDEW members are the largest investors in the German industry. In 2006, the German energy and water industry spent more than EUR 14 billion on infrastructure development and modernization.
Contact: www.bdew.de

German Technical and Scientific Association for Gas and Water (Deutsche Vereinigung des Gas- und Wasserfaches e.V. Technisch-wissenschaftlicher Verein – DVGW)
. With its approximately 12,000 members, DVGW defines technical rules for gas and water supply and disposal. Tasks of the non-profit organization include the control and certification of products, persons and companies, the initiation and promotion of research projects and training for the whole spectrum of issues relating to the gas and water industry..
Contact: www.dvgw.de

German Association for Water, Wastewater and Waste (Deutsche Vereinigung für Wasserwirtschaft, Abwasser und Abfall e.V. – DWA)
DWA icounts approximately 14,000 members: municipalities, universities, engineers, public authorities and companies.
Contact: www.dwa.de

Association of Local Utilities (Verband kommunaler Unternehmen e.V. – VKU)
VKU represents the interests of the municipal utilities in the sectors of water supply and wastewater disposal as well as energy and waste management. Almost 1,400 member companies with total sales of approximately EUR 71 billion and 233,000 employees are organized within the VKU. The investment volume of its members totals approximately EUR . 6.6 billion The municipal utilities provide The VKU water and wastewater division represents an independent organization unit of more than 700 members.
Contact: www.vku.de / wasser

Major trade fairs:

Several major trade fairs are relevant for companies active in water or wastewater technologies in Germany and neighboring countries. The U.S Commercial Service strongly suggests that American exporters consider participating in one or more of these fairs because they are regarded as important vehicles to enter the German and other major European markets. The U.S. Commercial Service often partners with fair organizers to be able to offer attractive packages for U.S. exhibitors at featured events.

Water Berlin – International Trade Show and Convention
March 30 - April 3, 2009 in Berlin, Germany
Information: www.wasser-berlin.de

IFAT – International Trade Show for Water, Wastewater, Waste, Recycling
May 2011 in Munich, Germany
Information: www.ifat.de

Aquatech – International Trade Show for Drinking Water and Waste Water Technologies
September 30 – October 3, 2008, September 2010, Amsterdam (the Netherlands)
Information: www.amsterdam.aquatechtrade.com/

Please visit www.buyusa.gov/germany/en for a detailed list of trade shows and an overview of what the U.S. Commercial Service has to offer to American exporters at featured events.

Your Contact for more information on the water and wastewater disposal market in Germany:
Ms. Andrea Stahl, Commercial Specialist
U.S. Commercial Service
American Consulate General, Frankfurt, Germany
Phone: +49/69/7535-3120; Fax: +49/69/7535-3171
Email: andrea.stahl@mail.doc.gov
or visit our website: www.buyusa.gov/germany/en

The U.S. Commercial Service — Your Global Business Partner
With its network of offices across the United States and in more than 80 countries, the U.S. Commercial Service of the U.S. Department of Commerce utilizes its global presence and international marketing expertise to help U.S. companies sell their products and services worldwide. Locate the U.S. Commercial Service trade specialist in the U.S. nearest you by visiting http://www.export.gov/.